

INTRODUCTION

The Liverpool School of Tropical Medicine despatched the fifteenth expedition comprising Dr. Anton Breinl and the writer to Manáos in April, 1905, in order to investigate yellow fever and the diseases of the Amazon State. This expedition was the second sent to the Amazon region, the first one in 1900 having been stationed in Pará. Shortly after its arrival in Manáos, both members were attacked by yellow fever, and subsequent complications in the case of Dr. Breinl unfortunately necessitated his return to Europe, and thus his valuable services were lost to the expedition.

No trained assistance was procurable and all the work has had to be performed single-handed. The report presented embraces only a portion of the work of the research laboratory in Manáos. I have to thank those gentlemen who were kind enough to contribute chapters to this report; it would have been impossible otherwise to have dealt with such a variety of subjects. It is hoped to complete later the account of all the investigations pursued during the years 1905 to 1909, and to publish, at short intervals, a series of papers on subjects affecting the welfare and hygienic conditions of the Amazon region. The district is so rich in material that it would require a large staff of workers to carry out the researches on the spot; by collecting the material and forwarding it to Europe, it is possible to induce European authorities to issue short monographs on their subjects.

In many respects the 1905-1909 Expedition to the Amazon differs from the expeditions previously despatched by the School. A permanent laboratory was necessary, and attention had to be given to a multiplicity of details which are usually foreign to a travelling commission. On the other hand numerous advantages arose out of the permanency of the laboratory, since patients could be kept under continued observation and experiments inaugurated which would have been impossible under other conditions.

The main object of the expedition was to investigate yellow fever, and, if possible, endeavour to advance our knowledge of this disease. Chimpanzees have been successfully inoculated; rabbits and guinea-pigs have exhibited certain reactions when inoculated

with infective blood from yellow fever cases or subjected to the bites of infected *Stegomyia calopus*. The results at first were very erratic, but, subsequently, with improvement in technique and important details, the reactions were more positive and could be gauged with certainty. Unfortunately it has proved impossible to test the reactions by human inoculations, and the chimpanzees were too few in number to be able to prove all the different points. Many tests have to be made and experimental work revised at all points, and therefore it is considered inadvisable to make public the exact technique employed until an exhaustive report can be presented. The experiments were discontinued for lack of animals susceptible to the disease, and the expedition returned to England in February, 1909. A new expedition has now been organised and provision made for an adequate supply of chimpanzees. With improved accommodation for the experimental animals, and with the experience gained from the work of the past years, it is confidently expected that an early and satisfactory report can be published.

An expedition should endeavour to assist the local authorities and aid the medical profession. Therefore the resources of the laboratory in Manáos were placed at the disposal of the State, the medical fraternity, the hospitals, and the poor of the city. Examinations of blood, agglutination reactions for typhoid and paratyphoid, bacteriological examinations of water and milk, post-mortems and pathological reports were made, and the laboratory so conducted as to be of the greatest possible service to the community. As a consequence much routine work had to be performed. From the manifestations of sympathy and the co-operation extended to the expedition by the State authorities and the doctors of Manáos, it is believed that the work of the laboratory has proved of real service.

It is a matter of congratulation that the relations between the State and myself were of the most cordial character. Every facility was offered by those in authority to lighten the task of the investigation; laboratory accommodation was provided, and instructions given that the aims of the expedition should be expedited in every way.

The investigation was begun during the term of office of the Governor Coronel Constantino Nery, and was continued under the Acting-Governor Coronel Affonso de Carvalho, both of whom

displayed much interest and were of great assistance to the expedition. The present Governor of the State of Amazonas, His Excellency Coronel Antonio Bittencourt, manifested much sympathy with the work, and extended an invitation to the expedition to return to Manáos to complete the various researches which were left unfinished.

The Directors of the Servico Sanitario, Dr. Alfredo da Matta and Dr. Miranda Leão, and their colleagues on the medical board, did everything that was possible to promote the work of the laboratory. The active and loyal co-operation of the medical profession in Manáos also contributed largely to the success of the expedition. Without this aid, freely rendered on all sides, little work could have been accomplished, and the intimate relationship which existed between all parties has been attended with pleasant memories. It is impossible to specify individually the names of our co-workers, since it would involve the enumeration of the whole of the medical profession in Manáos; but to one and all I wish to tender my warmest thanks.

In this expression of gratitude mention must be made of the authorities of the Santa Casa de Misericordia, and Portugueza Beneficente, and the Sisters of the Religious Orders who are responsible for the nursing of the patients. Here again help was freely and continuously given.

The business firms and their staffs in Manáos, and the subscribers to the expedition have been of assistance in every possible way. Invidious though it be to single out an individual firm, I must, however, express my warm appreciation of the interest which the Booth Steamship Company exhibited in the work. The sub-committee in charge of the organisation of the expedition was composed of two of the Directors of the Company, and no request, however extravagant and exacting it might seem, was refused. Without their co-operation experimental work with such costly animals would have been impossible, nor could the chimpanzees have been imported under mosquito-proof conditions.

In compiling this report, which is the outcome of nearly three and a half years of actual observation, I have endeavoured to be as open and fair-minded as possible. The suggestions have been brought forward solely with the view to assist the authorities in Manáos in

their efforts to improve the local sanitary conditions. I can testify to the great improvements that have been made in the sanitation of Manáos since my arrival in 1905. Commercial enterprises are rapidly advancing, and as commerce extends the population of the Amazon region will steadily increase. Modern sanitary methods and anti-mosquito measures will therefore become a necessity even in the smaller towns along the Amazon and its tributary rivers.

In conclusion, my thanks are due to Sir Rubert Boyce for the use of his department in the Thompson-Yates Laboratories, and to Mr. Newstead for his advice and help. It has been a matter of much regret to me that serious ocular troubles should have prevented the completion of the detailed study of the material designed for this report. It is hoped, however, to publish the results of the experimental work at an early date.

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